What we claim is:

1. An implantable prosthesis comprising a rigid material with pores, wherein a filler comprising a hydrogel, a structural protein, a bioactive agent, or mixtures thereof, is located within the pores.

2 The implantable prosthesis of claim 1 wherein the filler fills the pores.

3. The implantable prosthesis of claim 2 wherein the rigid porous material with the filler presents a smooth surface to flow.

4. The implantable prosthesis of claim 1 wherein the filler partly fills the pores.

5. The implantable prosthesis of claim 1 wherein the filler comprises a hydrogel selected from the group consisting of poly(ethylene glycol), poly(hydroxyethyl methacrylate), partially or fully hydrolyzed poly(vinyl alcohol), poly(vinylpyrrolidone), poly(ethyloxazoline), poly(ethylene oxide)-co-poly(propylene oxide) block copolymers, polyamines, polyacrylamide, hydroxypropylmethacrylate, carboxymethyl cellulose, hydroxyethyl cellulose, methylhydroxypropyl cellulose, polysucrose, hyaluronic acid, alginate, chitosan, dextran, gelatin and mixtures and copolymers thereof.

6. The implantable prosthesis of claim 1 wherein the filler comprises a structural protein.

7. The implantable prosthesis of claim 6 wherein the structural protein is an extracellular matrix protein.

8. The implantable prosthesis of claim 1 wherein the filler comprises a mixture of hydrogel and structural protein.

9. The implantable prosthesis of claim 1 wherein the filler comprises a biologically active agent.

10. The implantable prosthesis of claim 9 wherein the biologically active agent is dispersed within the hydrogel or protein.

11. The implantable prosthesis of claim 9 wherein the biologically active agent is selected from the group consisting of a growth factor, a cell attraction compound, an anticoagulant and combinations thereof.

12. The implantable prosthesis of claim 9 wherein the biologically active agent is VEGF.

13. The implantable prosthesis of claim 9 wherein the bioactive agent is a growth factor.

14. The implantable prosthesis of claim 9 wherein the bioactive agent is a progenitor attraction compound.

15. The implantable prosthesis of claim 9 wherein the bioactive agent is an anticoagulant.

16. The implantable prosthesis of claim 1 wherein the pores extend through the rigid material.

17. The implantable prosthesis of claim 1 wherein the pores have an interconnecting porosity.

18. The implantable prosthesis of claim 1 wherein a nutrient is also located within the pores.

19. The implantable prosthesis of claim 1 further comprising viable cells.

20. The implantable prosthesis of claim 1 wherein the rigid material comprises a rigid polymer.

21. The implantable prosthesis of claim 20 wherein the rigid polymer is selected from the group consisting of polysulfones, polyacetals, polyethersulfones, polyarylsulfones, polyetheretherketones, polyamides, polyurethanes, polytetrafluoroethylene, other fluoronated and perfluoronated vinylpolymers, polycarbonate, polyetherimides, tyrosine-derived polyarylate polymers, polylactic acid and polyglycolic acid-based composites and copolymers and mixtures thereof.

22. The implantable prosthesis of claim 1 wherein the prosthesis is a mechanical heart valve prosthesis comprising an orifice ring and a rigid occluder attached to the orifice ring.

23. The implantable prosthesis of claim 22 wherein the rigid occluder comprises the rigid material with pores.

24. A mechanical heart valve prosthesis comprising an orifice ring and a rigid occluder attached to the orifice ring, the rigid occluder comprising a biocompatible material with pores, wherein the biocompatible material comprises a polymer material, a carbonaceous solid or a ceramic, wherein the pores extend through the occluder.

25. The mechanical heart valve prosthesis of claim 24 further comprising a second rigid occluder attached to the orifice ring.

26. The mechanical heart valve prosthesis of claim 25 wherein the second rigid occluder comprises a biocompatible material with pores.

27. The mechanical heart valve prosthesis of claim 24 wherein the biocompatible material comprises a polymer material.

28. The mechanical heart valve prosthesis of claim 27 wherein the polymer material is selected from the group consisting of polysulfones, polyacetals, polyethersulfones, polyarylsulfones, polyetheretherketones, polyamides, polyurethanes, polytetrafluoroethylene, other fluoronated and perfluoronated vinylpolymers, polycarbonate, polyetherimides, tyrosine-derived polyarylate polymers, polylactic acid and polyglycolic acid-based composites, polyhydroxybutrate-based polymers and copolymers and mixtures thereof.

29. The mechanical heart valve prosthesis of claim 27 wherein the polymer material comprises polyetheretherketone.

30. The mechanical heart valve prosthesis of claim 24 wherein the biocompatible material comprises pyrolytic carbon.

31. The mechanical heart valve prosthesis of claim 24 wherein biocompatible material comprises a carbonaceous solid.

32. The mechanical heart valve prosthesis of claim 24 wherein the pores at the surface of the occluder have an average pore size from about 10 microns to about 1 millimeter.

33. The mechanical heart valve prosthesis of claim 24 wherein the pores of the rigid occluder have a polymer hydrogel or a structural protein within the pores.

34. The mechanical heart valve prosthesis of claim 34 wherein the occluder surface presents a smooth surface to the flow.

35. The mechanical heart valve prosthesis of claim 24 wherein the pores of the rigid occluder have biologically active compounds within the pores.

36. The mechanical heart valve prosthesis of claim 35 wherein the biologically active compounds comprise growth factors.

37. The mechanical heart valve prosthesis of claim 35 wherein the biologically active compounds comprise progenitor attraction compounds.

38. The mechanical heart valve prosthesis of claim 24 wherein a hydrogel is within the pores.

39. A method of forming an implantable prosthesis, the method comprising forming pores in a rigid material, the pore forming process selected from the group consisting of etching, mechanical striking of the surface, micromachining, dissolving of a soluble composition, heating a thermally decomposible material and using a foaming agent.